

M. Tech Odd Semester Examination, February, 2023

Agricultural Engineering
(Food Processing)
(1st Semester)

Course No.: 1AE216
(Thermal Food Processing Technologies)

Full Marks: 70

Pass Marks: 28

Time: 3 hours

- Note:**
1. Attempt 05 (Five) questions by taking one from each unit.
 2. Begin each answer in a new page.
 3. Answer parts of a question at a place.
 4. Assume reasonable data wherever required.
 5. The figures in the right margin indicate full marks for the question.

UNIT-I

1. (a) What is non-thermal food processing? Describe the advantages and limitations of non-thermal food processing technologies. 9
- (b) Discuss Radurization and Radappertization of high-pressure processing. 5
2. (a) During pulse electric field treatment of apple juice, a voltage of 65 kV was applied in exponentially decaying form to create electric field strength of 35 kV cm^{-1} at ambient temperature. If resistance of the pulse electric field treatment chamber, pulse duration, and the surface area of the electrodes is 50Ω , $20 \mu\text{s}$, and 0.325 cm^2 , respectively, calculate the total energy stored inside the capacitors. 8

- (b) Discuss the applications of high pressure in food processing and preservation. 6

UNIT-II

3. (a) With the help of a neat diagram describe the high intensity pulsed electric field processing system for non-thermal preservation of food and its merits. 9
- (b) Write down the mechanism and advantaged of HPP. 5
4. (a) Discuss the generation of high intensity magnetic fields for food preservation with a neat figure. 7
- (b) Explain the working principle of ultrasound in food applications with a figure. 7

UNIT-III

5. (a) With a figure discuss the variation of pressure and temperature in a non-insulated high pressure vessel. 7
- (b) How the temperature can be controlled during high pressure treatment of food? 7
6. (a) Explain the difference between the Pulse UV light and Pulse electric field non thermal processing. 8
- (b) Discuss the selection of suitable packaging material for non-thermal food processing. 6

UNIT-IV

7. Describe radiation sources and their applications in food preservation. 14

8. Write a short note on the following
- (a) Hurdle technology
- (b) Minimally processed food
- (c) Isostatic rule
- (d) Le Chatelier's principle 14
9. How consumers accept non thermal technologies? Write down its economic evaluation. 14
- 10 Write down the factors affecting the outcome of pulsed electric fields treatments. 14
